

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 2 of 14

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claim 1 (currently amended): A current detection circuit, ~~characterized by~~ comprising:  
a first transistor ~~for supplying~~ arranged to supply load current to a load;  
a current detection transistor having a control electrode ~~receiving~~ arranged to receive the same control signal as applied to the control electrode of said first transistor, said current detection transistor ~~adapted~~ arranged to supply a proportional current that is proportional to said load current;  
a buffer circuit having an idling current source ~~for supplying~~ arranged to supply a predetermined idling current to an output node of said current detection transistor, said buffer circuit ~~adapted~~ arranged to equalize the output voltage of said first transistor with the voltage at said output node of said current detection transistor, and ~~adapted~~ arranged to output a detection current that amounts to the sum of said proportional current and said idling current; and  
a conversion circuit ~~for converting into an output signal~~ arranged to convert said detection current outputted from said buffer circuit into an output signal.

Claim 2 (currently amended): A current detection circuit, ~~characterized by~~ comprising:  
a current controlling transistor having a control electrode and an output electrode connected to said control electrode;  
a variable-current type control-current supplying current source ~~for flowing~~ arranged to direct controlled current through said current controlling transistor;  
a first transistor connected to said current controlling transistor in a current mirror configuration ~~for supplying~~ to supply load current to a load;

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 3 of 14

a current detection transistor connected to said current controlling transistor in a current mirror configuration ~~for supplying to supply~~ a proportional current that is proportional to said load current;

a buffer circuit having an idling current source ~~for providing~~ arranged to provide a predetermined idling current to the output node of said current detection transistor, said buffer circuit ~~adapted~~ arranged to equalize the output voltage of said first transistor with the voltage at said output node of said current detection transistor, and ~~adapted~~ arranged to output a detection current that amounts to the sum of said proportional current and said idling current; and

a conversion circuit ~~for converting into an output signal~~ arranged to convert said detection current outputted from said buffer circuit into an output signal.

Claim 3 (currently amended): The current detection circuit according to claim 1, ~~characterized in that wherein~~ said buffer circuit ~~has further comprises:~~

an amplifier ~~fed with~~ arranged to receive the output voltage of said first transistor and the voltage appearing at the output node of said current detection transistor; and

a third transistor provided between said output node of said current detection transistor and said conversion circuit, and controlled by the output of said amplifier.

Claim 4 (currently amended): The current detection circuit according to claim 1, ~~characterized in that wherein~~ the power supply voltage supplied to said idling current source is equal to or higher than the first power supply voltage supplied to said first transistor and said current detection transistor.

Claim 5 (currently amended): The current detection circuit according to claim 1, ~~characterized by~~ further comprising:

a switching circuit provided in said idling current source;

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 4 of 14

a comparator ~~for generating~~ arranged to generate a comparison output to switch off said switching circuit when said output signal exceeds a reference level.

Claim 6 (currently amended): The current detection circuit according to claim 5, ~~characterized in that~~ wherein said comparator has a characteristic hysteresis having a predetermined hysteresis width.

Claim 7 (currently amended): The current detection circuit according to claim 1, ~~characterized by~~ further comprising:

a switching circuit provided in said idling current source and ~~arranged to be~~ switched on by an idling signal; and

a timing circuit ~~for outputting~~ arranged to output said idling signal for a first predetermined period of time upon receipt of said control command signal and ~~for outputting to output~~ said control signal after a second predetermined time has elapsed since the receipt of said control command signal, said second predetermined time being shorter than said first predetermined time.

Claim 8 (currently amended): A load drive circuit ~~for performing~~ arranged to perform pulse-width-modulated (PWM) driving of a single-/multi-phase load, said load drive circuit having at least two series circuits such that each of said series circuits includes: a first transistor coupled between a first power supply voltage and the output node connected to said load to supply load current to said load when switched on by a switching signal; and a second transistor coupled between a second power supply voltage and said output node and switched on and off by a ~~PWM~~ pulse-width-modulated switching signal, and that said series circuits together ~~form define~~ a single-/multi-phase bridge circuit ~~for driving~~ arranged to drive said single-/multi-phase load, ~~said load drive circuit characterized in that~~ wherein:

each of said series circuits comprises:

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 5 of 14

a current detection transistor arranged to receive ~~receiving~~ the same switching signal as the switching signal supplied to said first transistor to provide a proportional current proportional to said load current; and

a buffer circuit having an idling current source ~~for providing~~ arranged to provide a predetermined idling current to the output node of said current detection transistor, said buffer circuit ~~adapted~~ arranged to equalize the output voltage of said first transistor with the voltage at said output node of said current detection transistor, and ~~adapted~~ arranged to output a detection current that amounts to the sum of said proportional current and said idling current, ~~and characterized in that; and~~

said load drive circuit further comprises a conversion circuit ~~for collectively converting~~ arranged to collectively convert into an output signal the detection currents outputted from the respective buffer circuits.

Claim 9 (currently amended): A load drive circuit having at least two current output circuits ~~to form~~ defining a single-/multi-phase bridge circuit ~~for driving~~ arranged to drive a single-/multi-phase load, each of said current output circuits including: a current controlling transistor having a control electrode and an output electrode connected to said control electrode; ~~[[=]]~~ a control-current supplying current source ~~for supplying~~ arranged to supply controlled current to said current controlling transistor; a first transistor connected to said current controlling transistor in a current mirror configuration and provided between a first power supply voltage and the output node of said load drive circuit supplying load current to said load; and a second transistor connected between said output node and a second power supply voltage and configured to be switched on and off by a switching signal, ~~said load drive circuit characterized in that~~ wherein:

each of said current outputting circuit comprises, in association with the first transistor thereof:

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 6 of 14

a current detection transistor, connected to said current controlling transistor in a current mirror configuration ~~for supplying to supply~~ a proportional current that is proportional to said load current; and

a buffer circuit having an idling current source ~~for providing~~ arranged to provide a predetermined idling current to the output node of said current detection transistor, said buffer circuit ~~adapted~~ arranged to equalize the output voltage of said first transistor with the voltage at said output node of said current detection transistor, and ~~adapted~~ to output a detection current that amounts to the sum of said proportional current and said idling current, ~~and characterized in that; and~~

said load drive circuit comprises a conversion circuit ~~for collectively converting~~ arranged to collectively convert the detection currents outputted from the respective buffer circuits into an output signal.

Claim 10 (currently amended): The load drive circuit according to claim 8, ~~characterized in that wherein~~ wherein said buffer circuit ~~has~~ comprises:

an amplifier ~~fed~~ arranged to receive with the output voltage of said first transistor and the voltage appearing at the output node of said current detection transistor; and

a third transistor provided between said output node of said current detection transistor and said conversion circuit, and controlled by the output of said amplifier.

Claim 11 (currently amended): The load drive circuit according to claim 8, ~~characterized by~~ further comprising:

a switching circuit provided in said idling current source; and

a comparator ~~for generating~~ arranged to generate a comparison output when said output signal exceeds said reference level, to thereby switch off said switching circuit by said comparison output.

January 14, 2009

Reply to the Office Action dated October 20, 2008

Page 7 of 14

Claim 12 (currently amended): The load drive circuit according to claim 8, ~~characterized by~~ further comprising:

a switching circuit provided in said idling current source and arranged to be switched on by an idling signal; and

a timing circuit ~~for outputting~~ arranged to output said idling signal ~~for~~ during a first predetermined period of time upon receipt of said control command signal and ~~for outputting~~ arranged to output said control signal after a second predetermined time has elapsed since the receipt of said control command signal, said second predetermined time being shorter than said first predetermined time.

Claim 13 (currently amended): A memory storage ~~characterized by~~ comprising:

a load drive circuit in accordance with claim 8; and

a motor arranged to be driven by said load drive circuit.